EXHIBIT 8
DATE 1/16/07
HB 648

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August 14, 2006

Richard Knatterud, P.E.
Montana Dept of Commerce
Treasure State Endowment Program
PO Box 200523
Helena, MT 59620-0523

Re: Elk Meadows TSEP Grant
Water System Improvements Project

Dear Richard:

On behalf of the Elk Meadows Ranchettes Water District, we have concluded our response to the review report provided on July 27, 2006 for the referenced project as well as supplemental comments provided by you on July 28, 2006. We noted that there is virtually no agreement between the two sets of comments and we found that the primary technical reviewer often based his/her comments on opinion without clarification or technical support. Consequently, we were required to provide a lengthy response to address these comments. We are hopeful that our responses are given full consideration by the review group and that the District gets a fair and equitable assessment of their project. That said, we do appreciate the opportunity to provide this input. Our comments are, as follows:

Comment Set #1 Review Report Form

Comment on Priority #1, Section a.

The TSEP reviewer accurately summarized the need for water supply and distribution system improvements. However, the reviewer concluded that additional water storage is not required because the existing tank meets current requirements for fire suppression and stated that there is "no compelling information" submitted to support this improvement. Furthermore the reviewer indicated that "at present the tank satisfies a flow of 500 gpm for two hours, which is the required flow."

Response

We disagree with these statements and believe that it would irresponsible to suggest that the existing storage tank is adequately sized. The existing storage tank has been very effective for the District in helping them get through high demand periods and has, on occasion, been nearly drained through domestic use, without being used for fire protection (page III-17). The limited capacity of existing water supply supports the need for more than the absolute minimum sizing of storage tanks. Storage tank volume can

be determined several different ways but the practice of designing a tank to hold the average daily demand plus fire flow is common. As shown on page IV-15, we considered different scenarios for sizing the tank including the provision of minimum fire flows of 500 gpm for 2 hours and the provision of 1000 gpm for 2 hours. For design demand, this results in a storage tank size ranging from 115,000 gallons to 175,000 gallons. **The existing 110,000 gallon tank is obviously smaller than either of these two calculated volumes**. Furthermore, the District is located in a wooded setting and, as stated in the PER, use of the higher fire flow (1000 gpm) for sizing the tank would be prudent

As stated on page IV-16, the existing storage tank was installed with expansion in mind and the booster pumps were designed to allow pumping for a higher head capacity. Based on quotes from the original supplier, the existing tank can be increased in volume in a very cost-effective manner. As stated on page IV-10, there are a few lots on the systems that have low residual pressures due to their location in proximity to the water tank. Raising the tank by 20' feet in height will increase these pressures by as much as 9 psi.

To summarize, we believe that the storage tanks should be increased in size for the following reasons:

- The existing tank has been fully utilized during current high demand periods
- The existing tank cannot satisfy design minimum fire flow storage requirements
- Adequate storage volume can help compensate for an inadequate groundwater supply during high demand periods
- Additional head in the storage tank provides increased pressure for those services located in proximity to the existing tank
- The existing tank was designed for expansion and the work can be completed in a cost-effective manner

We also believe that these arguments were supported in the PER.

Comment on Priority #1, Section a.

The TSEP reviewer included discussion, under Section a. of Statutory Priority #1, indicating that no public health hazard exists with the high copper concentrations that have been experienced in the Elk Meadows water system due to corrosive nature of the water. The reviewer concluded that copper was not a problem because no violations of the copper standard occurred in 2005.

Response

We disagree with this opinion. The health based standard for copper is 1.3 mg/l, derived from an analysis of a group of samples collected from the distribution system. As shown in the Water Quality Data in Appendix A, page 9 of 13, copper concentrations in excess of the standard occurred twice in 2005 with recorded copper levels of 1.7 mg/l and 1.4 mg/l as shown. Because of the statistical methods by which sets of copper samples are evaluated for compliance, the high levels did not constitute an excursion. However, **if** the second sample of the 12/29/05 sample set was 1.31 mg/l rather than 1.30 mg/l, a violation of the standard would have occurred. Standards were violated in 2004 and 2006 data collected so far (not in the PER) indicate that the standard would be violated. The system has a history of problems with violations of the copper standard and the characteristics of the source water clearly indicate that it is a corrosive water. To conclude, based on a selective analysis of one year of data, that an existing or imminent copper problem does not exist in Elk Meadows is not an accurate consideration of the available data.

The District installed equipment to inject a corrosion inhibitor in the water supply in 2001 (Page IV-5) to reduce the corrosion potential of the water supply. The numerous high copper levels identified in Appendix A suggest that the treatment process is not working successfully. Furthermore, the flowchart taken from the EPA Revised Guidance Manual for Selecting Lead and Copper Strategies on page IV-6 of the PER indicates that the pH of the water supply should be raised to a range of 7.2 to 7.8 for the use of corrosion inhibitors to be effective. As noted on page IV-5, the pH of the Elk Meadows water supply is consistently below this level, consequently other means are required to reduce the corrosion potential of the water. Note that the flowchart suggests that aeration may be an appropriate measure for raising the pH, thereby improving the effectiveness of the corrosion inhibitor. We have effectively used aeration for raising the pH on another corrosive groundwater supply in western Montana and are convinced it is a viable technology to supplement the existing process.

We believe that it is incorrect to state that these continual violations of the copper standard do not pose a public health risks. The standards for copper were established to prevent public health risks and the Elk Meadows water quality data shows an ongoing history of violating these standards.

<u>While outside of the scope of this PER and TSEP grant application</u>, we recommended to the District that they try different blends of poly and orthophosphate compounds with the hope of finding a blend that would reduce copper concentrations. While the EPA guidance manual suggested that these corrosion inhibitors also require pH adjustment, we felt that it would be a worthwhile effort. This effort began in February of 2006 and initial results indicated copper levels in excess of the standard. This good faith effort by the District to optimize existing equipment should not be construed as a solution to the problem nor does it suggest in any way that the demonstrated public health risk due to high copper levels in the District's water supply is no longer present. The proposed improvements for corrosion control are recommended to optimize the existing treatment process, regardless of what chemical blend of corrosion inhibitor is being utilized.

Statutory Priority 3

Comment Section b.

The TSEP reviewer indicated that "The proposed project does not address fire suppression improvements for the upper pressure zone, other than to indicate that such improvements would be cost prohibitive. It is not clear in the PER if the District intends to leave this upper zone as a domestic water supply only, without fire suppression capability.

Response

It would appear that the reviewer's first statement would supply an appropriate answer to the second statement made. As stated in the PER, page IV-18, we recommended improvements to the existing upper level storage tank be made and stated "the storage tank does not have sufficient volume to provide adequate water for fire fighting and no hydrants are located in the upper zone." We believe that this statement, in the context of the recommended improvements for the upper pressure zone tank, indicates that the upper zone is to be used as a domestic water supply only. We are not sure what else it could be.

We would reiterate also that we do believe it is cost prohibitive to install a 65,000 plus gallon storage tank to serve a small pressure zone with 10 homes. The Elk Meadows water system has several high priority needs and the resultant project is expensive. Providing adequate water storage in the lower pressure zone will provide reasonable access to hydrants for fire protection throughout the District under the recommended plan.

Comment Section c.

Same comment as noted for Section b above. Please note our response above.

Comment Section d.

The reviewer stated that it was their opinion that "the PER does not adequately support project elements that will increase storage capacity of the existing 110,000 gallon storage tank or the installation of additional corrosion control equipment.

Response

The TSEP reviewer did not offer any technical documentation to support this opinion whereas, as discussed previously under our response to a similar comment under Statutory Priority #1, we believe that the PER provides adequate technical documentation based on sound engineering practice to support our recommendations. Both improvements are needed to protect the public health and safety of the water supply. Storage is needed for the following reasons:

- The existing tank has been fully utilized during current high demand periods
- The existing tank cannot satisfy design minimum fire flow storage requirements
- Adequate storage volume can help compensate for an inadequate groundwater supply during high demand periods
- Additional head in the storage tank provides increased pressure for those services located in proximity to the existing tank
- The existing tank was designed for expansion and the work can be completed in a cost-effective manner

Regarding the comments on corrosion control, the pH adjustment of the water supply is needed to reduce the corrosive potential of the water supply to eliminate the continuing violations of an enforceable public health standard for copper. The proposed unit process will supplement the existing equipment in a manner consistent with the primary EPA Guidance Manual for developing corrosion control plans.

Comment Section e

"there are no project elements that address improvements to provide fire suppression in the upper pressure zone. As noted above, it is not clear if the District intends to provide this level of service in this zone."

Response

As stated previously, we believe that the PER clearly indicates that fire protection is not being provided in the upper pressure zone due to the inordinate expense to provide this level of service for a limited number of homes. There is no regulatory standard which indicates the water system serving the upper pressure zone should be upgraded to provide fire protection capability.

Comment Section e

In the reviewer's opinion, the project component pertaining to the development of one or two new water supply wells is lacking in substantial detail and the technical design using 6" diameter wells would probably fail to meet the project objectives (because only 4" pumps could be installed above the screens, resulting in limited available drawdown and yield).

Response

The TSEP reviewer appears to believe that the solution to the District's water supply problems can be readily resolved through analysis of the existing information and drawing conclusions on where water can be located, how much is available, what type of wells should be installed and of what pumping equipment should be used. We disagree with this oversimplified assessment of the problem and potential solution. Three well qualified hydrogeologists have looked at the conditions surrounding the

District's wells and have reached very different conclusions. The information provided by Land and Water in the Appendix E and the review of this data by the DNRC staff hydrogeologist typifies the complexity of the situation and lack of agreement on what the data means. It is our belief that further field work and testing is needed to properly locate available water supplies that do not cause adverse impacts to other users. The level of work scope and the costs associated with the hydrogeologic analysis goes beyond what is required at this level of project planning. Additionally, the cost for the hydrogeological analysis is significantly beyond the District's ability to pay at this time. This is why this work is included as part of the proposed project.

We do not understand how the reviewer can conclude that the use of 6" diameter wells would probably fail to meet the project objectives because only 4.0" pumps could be used. As stated on Page IV-3 of the PER, the existing wells have sustained flows of 30 to 40 gpm and we presumed that new wells drilled in this aquifer would be capable of producing similar levels of discharge. The DNRC comments and ultimate water right support this position. A 4.0" well pump can readily supply this flow volume. It should be noted the last two wells drilled were 8.0" wells yet only 4.0" well pumps were installed because of the limited capacity of the aquifer to supply additional water. While we would like to presume we could drill a well of higher capacity, it is premature to conclude this now and our decision to use 6.0" wells is based on the best information we have available at this time.

Comment Section e.

There was ample data provided in the PER to conduct a more detailed analysis with respect to well production and well sites; however, this analysis was not performed.

Response

We disagree with this statement. Presuming that the data referred to in the comment is the Land & Water and DNRC data, this information is not conclusive and is contradictory. It may tell us where not to drill wells but we cannot see how this information can be used to identify well sites without further analysis.

Comment Section e.

Because the well locations are planned on the same property as the existing wells, significant interference drawdown effects could be realized (these could have been analyzed relatively easily). A long-term solution may not be achieved unless more detailed analysis and planning is completed and design changes are made. The hydrogeology assessment that is included in the project must be relied upon to resolve these potential pitfalls.

Response

As stated on Page IV-3, the new wells will be located on private property or State Lands, pending further investigation. We did not indicate that the wells would be located on the same property as the existing wells and therefore any comments regarding interference do not apply. We agree that further analysis is needed to support a long-term solution to the District's water supply problems. That is why we included this analysis as part of the proposed project. We would reiterate that it is unreasonable to expect that the detailed hydrogeological analysis be completed at this point in the planning process, particularly for a small water district with limited resources.

Comment Section f.

Securing the actual well sites could result in substantial delays and increased costs, as these sites were not identified in the PER. Given the entire area is privately owned, and the District parcels are in an upland area that does not overly the aquifer, it is possible that securing good well sites could be a major problem. The existing wells were installed too close together (75 offset as shown on Figure III-1). It is possible this project will result in the same outcome because of land restrictions (the PER indicates the new wells would be installed on the same parcel, although this parcel appears too small to support up to four wells). It is possible that new utility easements will be required in order to obtain adequate well sites. This work could substantially delay the project, and could increase project costs.

Response

The TSEP reviewer appears to be speculating that the worst case scenario is going to develop. Yes, obtaining additional water supply does a pose risk in terms of cost and time. We believe we have developed a practical approach to address the problem at a reasonable cost. Due to the critical nature of the water supply problem and potential difficulties, the hydrogeological investigations are proposed to be fast-tracked to allow work to start in 2007 as described in the application and PER.

The entire area is not privately owned and state owned lands may be available for a new well in a location which overlies the aquifer. It is not clear how the reviewer gathered the technical data to conclude that the two existing wells are located too close together. We do not know why the previous design consultant decided to locate these wells in this manner. Drawdown tests surprisingly have shown that these wells are not interfering with one another. It should be noted that we did not indicate where the new wells were to be specifically located and the reviewer should rest assured that we would not locate them in the future in an area where they would adversely affect the District's existing wells or other private wells.

Utility easements are common on most public facilities projects and the work effort required to obtain easements understood. The proposed project enjoys public support and we anticipate that easements are obtainable. We are not building a sewage lagoon.

Comment Section f.

Water rights were discussed as an issue in PER, and remain an issue statewide. The District has already encountered some difficulty securing water rights. Based on aquifer testing data for the existing wells, it appears that permitting of new wells should be feasible. However, permitting the wells is to some degree political rather than scientific. If a contested case hearing were to result, the project could be substantially delayed by up to 2-years and have associated increased costs.

Response

Again, the TSEP reviewer appears to be speculating that the worst case scenario is going to develop. Yes - obtaining water rights can be a time consuming, difficult and possibly political issue. We cannot resolve these procedural problems in the format of a PER or a TSEP grant application and the purpose of this comment is unclear. We have to proceed through the process of obtaining water rights regardless of the time required.

Comment Section f.

In the reviewer's opinion, the proposed project elements to increase storage of the existing 110,000 gallon tank, and to install new corrosion treatment equipment are not supported by the PER. Costs for both of these items are not considered reasonable or well supported. With respect to corrosion treatment, it was not shown that modifications to existing treatment (e.g., higher dosing, different inhibitor) could not further reduce copper levels.

Response

We have addressed the comments regarding the need for the storage tank and corrosion control equipment previously. The comments on the unreasonableness of the costs is somewhat difficult to address in that the reviewer did not indicate if they believed that our costs were too high or too low nor did the reviewer provide any supporting documentation as to why they are unreasonable. Given this, the question of cost then boils down to the question of whose opinion is correct and we clearly believe that our opinion is more correct. We have spent hundreds of hours working on this project and we would presume, based on our past working experience with the TSEP program, that the reviewer has spent no more than 20 to 30 hours working on this specific project with a minimal portion of that time spent estimating costs.

Our cost data for the storage tank and corrosion control equipment is based on detailed unit cost price estimates utilizing accepted cost estimating procedures. We have a written quote from the tank contractor for expansion of the existing storage tank. **This is the same contractor that built the tank five years ago.** This contractor installed the control equipment and provided costs for upgrading the control system. We have evaluated the original and 2001 project drawings and previous bids for both the storage tank and corrosion control equipment. We have provided detailed drawings on how the new corrosion control equipment would fit within the available space including piping

modifications and incorporation of existing equipment. We designed and managed construction of an aeration system for corrosion control in Florence, Mt two years ago and understand quite well what the actual installed cost will be. We have written 50+ Preliminary Engineering Reports and Facility Plans (most in support of grant applications) and have reviewed well over 100 engineering reports prepared by other firms over the course of our career.

Comment Section f.

Auxiliary power installed at one or both booster stations, as described in the PER but not recommended unless required by DEQ, appears more reasonable and well supported than the tank and treatment improvements. Auxiliary power may be further considered in the preliminary design phase.

Response

Auxiliary power is provided to improve the reliability of service for the water system, primarily the water supply wells, booster pumps and treatment processes. Auxiliary power should not be considered as a replacement for adequate storage or for necessary treatment processes. We did not indicate in the PER that auxiliary power was "not recommended unless required by the DEQ." What we said in the planning document was that the proposed improvements, if implemented, should allow sufficient storage to allow the water system to function during a typical power outage. This conclusion was based on our analysis of the data regarding power outages in the area as discussed in Chapter IV.

The following is our response to the second set of comments provided on the Elk Meadows PER and grant application with some of the comments deleted through subsequent discussion with Richard Knatterud.

Comment

What is the basis for the fire flows used to evaluate the water system in the PER?

Response

The DEQ does not have specific fire flow requirements and defers to other authorities including the local fire departments or the State fire code (two agencies which may not agree). Generally the minimum acceptable fire flow for a residential community without commercial or institutional users is the capability to provide 500 gpm for a 2 hour period. This flow is supported by the ISO standards shown in AWWA Manual M31 and has been accepted by the DEQ and the TSEP program for similarly sized water systems,

including the review of the Spring Meadows water system improvements project with project plans and specifications approved in July of 2006. The local Elk Meadows fire authority indicated, in a previous study, that the provision of 500 gpm for a 2-hour period would be an acceptable fire flow. However, it appears the trend for new water systems is to provide a more conservative fire flow of 1000 gpm for 2 hours.

Given the lack of an absolute standard, we chose to evaluate the Elk Meadows water system utilizing both the minimum flow of 500 gpm as well as a 1000 gpm fire flow. The general character of the District is wooded and we were concerned about the potential for forest fires as well as house fires. Our water model in the Appendix F of the PER indicates summary output for both fire flows. We then evaluated the storage and distribution system for each flow condition to determine if the minimal and/or the more conservative fire flow could be addressed in an economically viable manner. Our analysis of the storage tank indicated that provision of the more conservation fire flow storage volume of 120,000 gallons could be addressed with a very cost-effective expansion of the storage tank. This improvement also serves other beneficial purposes for the overall system as described in the previous review comments. In evaluating the distribution system, the entire existing system would require total replacement to meet both the minimum and conservative fire flow standards, at a very high and unaffordable cost. Given this situation, we considered other alternatives for partially upgrading the distribution system to improve the capacity, hydraulics and operability of the water system. Upon conclusion of the analysis, we recommended an alternative for upgrading the distribution system that provides substantial improvement over the performance of the existing system at a reasonable cost. The proposed project will address all DEQ regulatory standards, meet the minimum fire flow standards in the distribution system (with exception of the upper pressure zone) and allow for an ample volume of water to support fire flows.

Comment 3.b

The PER states that pressures near or less than DEQ required minimum pressures (20 psi) exist in locations relative to existing water storage tanks. The PER did not indicate which water storage tanks or if this problem will be solved.

Response

Actually, what we said on Page III-16 and Page IV-10 was that there are a few lots on the system approaching 20 psil due to the location of the property relative to the existing water storage tanks. In specific response to the comment, we indicated in Appendix F, Water Model Summary Notes, that pressures below 20 PSI occur just below the middle and upper storage tanks. These are ground level storage tanks and it is reasonable to conclude that low pressures would occur in proximity to the tank. Our conclusions regarding the specific lots are based on our analysis of the location and elevation of the lot and the home on the lot relative to the storage tank.

Comment 3d.

The alternative analysis in the PER did not address low pressure areas identified in the PER. The water model included in the PER listed "junction nodes" that had pressures below DEQ required minimum pressures during maximum daily demand design flow and all fire flow scenarios with recommended distribution improvements. A map of the 'junction node" locations was not included in the PER to indicate the location of the low pressure areas

Response

The PER did not indicate water services below 20 PSI have occurred but that some lots have relatively low pressures approaching 20 PSI. We did indicate in the PER that the additional 20 feet of head that would be provided by upgrading the storage tank would benefit those lots with relatively low pressures. The problem with low pressures is limited is scope and we did suggest remedial measures consistent with the project recommendations.

No, we did not provide a map of the junction nodes in the PER. We did however describe in the model summary where representative low pressure values are located or noted and if the Figure III-1 Base Map is looked at the locations can be readily determined. A junction node map is not required by the PER outline and in this case, we believe that sufficient information on problem location was provided via the summary. All of the node pressures shown to be below 20 psi occur either at the base of the middle or upper storage tanks or at the new hydrant and have been adequately addressed. These low pressure areas did not occur in the distribution system at service connections and are not considered as a problem.

Comment 3d.

The lower existing booster station pumps do not appear to meet DEQ requirements for capacity. The PER states that the pumps produce a maximum of 105 gpm. DEQ I requires booster pumps to provide a minimum of maximum day pumping demand. The PER states that the design maximum day pumping demand for the District is 122 gpm. The booster station is located in proximity to the wells which are located within the floodplain. No information or mapping was provided to determine if the station is within the floodplain. No alternatives were analyzed or rationalization given to not increase booster pump size.

Response

The booster pumps were installed in 2002 with review and approval by the DEQ at that time. The peak design flow developed in the previous 2000 engineering study was greater than the peak flow developed in the current PER. The booster pumps are not inline on the distribution system but draw from two reservoirs of 26,000 gallons total volume. We did not believe that the output of the booster pumps was an issue that required further consideration in the PER for the following reasons:

- The pumps are relatively new and the size was accepted by the DEQ. Presumably, the service reservoirs were a factor in the acceptance of the pump size.
- The service reservoirs serving the pumps reduce the need to size the pump for peak demand. The output of the existing wells further indicates that the pumps should not be oversized.
- The pumps readily meet current maximum day pumping demand and can be replaced in the future, if and when additional demand occurs. It would be a poor investment for the District to suggest replacing these pumps at this time.

The lower pump station and treatment facility may be in the floodplain. Specific floodplain information on Six Mile Creek is generally not available. We sent a map to the DNRC and asked for information regarding the proposed project and received no response. We followed this up with a call and received minimal information. There is no indication that flooding has adversely impacted this facility. We did not have adequate resources to complete a detail floodplain analysis of Six Mile Creek. Further information would be obtained during design.

Comment 3e.

The proposed new fire hydrant #8 does not meet DEQ required flow or pressure requirements

Response

The hydrant does not meet DEQ pressure requirements and would require a deviation from standards, to be obtained during project design. DEQ does not have flow standards for hydrants but this hydrant does provide adequate fire flows at reduced pressures. The hydrant was located near the storage tank to allow more convenient access to the reservoir for fire protection. It should have been shown as being connected directly to the storage tank. We discussed this arrangement with the DEQ and they indicated support of the general concept. Obviously further design level information is needed to support the hydrant in this location.

Comment 3 f.

The analysis of the proposed wells did not include a location map to show the proposed location in relation to the existing water system. No proposed technical design or costs are included for required infrastructure to connect the new wells to the existing water system,

Response

A specific location map was not provided because we will not know where the wells will be located until the hydrogeological investigation, to be performed with the proposed project, is complete. Until the location of the wells is known, it is difficult to provide technical design on required infrastructure. The cost analysis shown in Table IV-1 and Table IV-2 provided $9,000 for piping connections, electrical and controls for each well to allow for necessary connecting infrastructure.

Summary of Public Health and Safety Issues

Our summary of need as allowed for Statutory Priority #1 is as follows:

The most serious deficiency in the Elk Meadows water system is the lack of adequate water supply capable of serving the needs of existing and future users. The wells cannot meet maximum daily demand despite conservation efforts. Failure of a well would put the system in a critical condition. During higher demand periods, water levels in the storage tanks have dropped dangerously low and continued pumping of the groundwater wells has dropped pumping water levels to the top of the well pumping units, causing the pumping of air. The limited water supply, lack of adequate storage and undersized water mains severely limit the ability of the water system to provide adequate water for fire protection. The booster station serving the upper pressure zone allows for no pumping redundancy and this area has lost water entirely in the past. The existing water supply is corrosive and the standard for copper has been violated. The system needs meters to limit water use.

Thank you for consideration of these responses. Please contact me at 449-3303 if you have any questions.

Sincerely,

Scott Anderson
Anderson-Montgomery Consulting Engineers

cc: Pat Hardman, Elk Meadows Water District